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ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-40475-2
Laboratory Sample Delivery Group: GJ46599769
Client Project/Site: HPNS-Parcel G 501197
Revision: 1

For:
Aptim Federal Services LLC
4005 Port Chicago Hwy, Suite 200
Concord, California 94520

Attn: Rose Condit

Rhonda Ridenhower

Authorized for release by:
5/11/2021 3:28:40 PM

Rhonda Ridenhower, Client Service Manager
(314)298-8566
Rhonda.Ridenhower@Eurofinset.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 160-40475-2

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

CASE NARRATIVE

Client: Aptim Federal Services LLC

Project: HPNS-Parcel G 501197

Report Number: 160-40475-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an ""as received"" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

The matrix for the Method Blank and LCS is as close to the following samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

Revision 1- Additional information requested in case narrative for strontium

Job ID: 160-40475-2 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

RECEIPT

The samples were received on 11/19/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 13.5 C.

Client requested total strontium and strontium 90 to be analyzed four times for the single sample in addition to isotopic plutonium.

STRONTIUM-90 (GFPC)

Sample HPPG-ESU-TU079A-001 (160-40475-1) was analyzed for Strontium-90 (GFPC) in accordance with EPA 905. The samples were dried on 11/20/2020, prepared on 01/20/2021 and analyzed on 01/29/2021.

When taking small mass aliquots from dried/disaggregated sample, the laboratory avoids large rocks/pebbles (as well as sticks, etc) which may constitute a larger than representative portion of the aliquot. Smaller rocks may be included. This is consistent with QSM and Laboratory. HPPG-ESU-TU079A-001 (160-40475-1).

The bracketing (day after the sample count) daily background (CCB) was outside the established QC criteria for the detector on which the method blank (MB) counted. However, while the MB result is above the DLC and RL, the z-score is within QSM QC limits (<3), and can be found in the level IV raw data. As all the samples in this batch exhibit results below the achieved DLC, this excursion does not adversely affect the data.
No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL BETA STRONTIUM (GFPC)

Sample HPPG-ESU-TU079A-001 (160-40475-1) was analyzed for Total Beta Strontium (GFPC) in accordance with EPA 905. The samples were dried on 11/20/2020, prepared on 01/22/2021 and analyzed on 02/12/2021.

When taking small mass aliquots from dried/disaggregated sample, the laboratory avoids large rocks/pebbles (as well as sticks, etc) which may constitute a larger than representative portion of the aliquot. Smaller rocks may be included. This is consistent with QSM and Laboratory. HPPG-ESU-TU079A-001 (160-40475-1).

A sample duplicate (DU) was not reported for this batch due to the client requesting 4 replicates of this sample to be reported. HPPG-ESU-TU079A-001 (160-40475-1).

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ISOTOPIC PLUTONIUM (ALPHA SPECTROMETRY)

Sample HPPG-ESU-TU079A-001 (160-40475-1) was analyzed for Isotopic Plutonium (Alpha Spectrometry) in accordance with A-01-R. The samples were dried on 11/20/2020, prepared on 01/08/2021 and analyzed on 01/19/2021.

The method blank (MB) Z-score is within limits and is located in the level IV raw data. (MB 160-494387/1-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHAIN OF CUSTODY

Ref. Document # 501197RSY-035

APTIM

APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520

Project Manager: Lisa Bercik
Phone #: (619)213-3389

Send Report to: Rose Condit
Phone/Fax Number: 415-987-0760
Address: 4005 Port Chicago Hwy

Sample Lead: Lewis, Devin

Sample Tech(s): Andrew Murri
Paul LeBlanc

Project Number: 501197
Project Name: Hunters Point Naval Shipyard: Parcel G Remedial Action
Project Location: San Francisco, CA
Purchase Order #: 1159058
Shipment/Pickup Date: 11/18/2020
Waybill Number: 4957 0225 6310
Lab Destination: Test America (St. Louis Lab)
13715 Rider Trail North
Earth City, MO 63046
Lab Contact Name/ph # Rhoeda Ridenbower (314)298-8566

160-40475 Chain of Custody

	Collection Information						Analysis Requested								
Sample ID	Date	Time	Method	Matrix	# of Containers	Preservatives (water) / Preservatives (soil) / Container Type	Gamma Spec (EPA 901.1 M) - Full 21 day in growth gamma		Strontium-90 (EPA 905 MOD)				Dose Rate uR/Hr	Evidence Bag ID	Comment
HPPG-ESU-TU079A-001	11/18/2020	10:38	G	SO	1	16 oz. plastic jar	X		X				4	GJ46599769	
HPPG-ESU-TU079A-002	11/18/2020	10:40	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-003	11/18/2020	10:43	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-004	11/18/2020	10:46	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-005	11/18/2020	10:49	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-006	11/18/2020	10:52	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-007	11/18/2020	10:55	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-008	11/18/2020	10:58	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	

Special Instructions: 21 day ingrowth results only

Turnaround Time: 3-day ☐ 10-Day ☐ 28-day ☐ Other ☐ **Level of QC Required:** I II III **Project Specific**

Method Codes C = Composite G = Grab **Matrix Codes:** DW = Drinking Water ; So = Soil; GW = Ground Water; SL = Sludge; WW = Waste Water; CP = Chip Samples; A = Air ; ABS = Asbestos; PO = Pipe Opening

Relinquished By:	Relinquisher Signature:	Relinquish Date Time:	Received By:	Received Signature:	Receive Date Time:
Lewis, Devin		11/18/2020 14:06	SHIPPEDTOLAB		11/19/2020 0915

*** Last 3 transfers shown above - Complete list of transfers on last page ***

CHAIN OF CUSTODY

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4005 Port Chicago Hwy
Concord, CA 94520

Project Manager: Lisa Bercik
Phone #: (619)213-3389

Send Report to: Rose Condit
Phone/Fax Number: 415-987-0760
Address: 4005 Port Chicago Hwy
City: Concord, CA 94520

Sample Lead: Lewis, Devin

Sample Tech(s): Andrew Murri
Paul LeBlanc

Project Number: 501197
Project Name: Hunters Point Naval Shipyard: Parcel G Remedial Action
Project Location: San Francisco, CA
Purchase Order #: 1159058
Shipment/Pickup Date: 11/18/2020
Waybill Number: 4957 0225 6310
Lab Destination: Test America (St. Louis Lab) 13715 Rider Trail North Earth City, MO 63046
Lab Contact Name/ph #: Rhoeda Ridenbower (314)298-8566

	Collection Information						Analysis Requested								
						Preservatives (water)	Gamma Spec (EPA 901.1 M) - Full 21 day in growth gamma		Strontium-90 (EPA 905 MOD)				Dose Rate uR/Hr	Evidence Bag ID	Comment
Sample ID	Date	Time	Method	Matrix	# of Containers	Preservatives (soil)									
						Container Type									
HPPG-ESU-TU079A-009	11/18/2020	11:01	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-010	11/18/2020	11:04	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-011	11/18/2020	11:07	G	SO	1	16 oz. plastic jar	X		X				4	GJ46599769	
HPPG-ESU-TU079A-012	11/18/2020	11:10	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-013	11/18/2020	11:11	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-014	11/18/2020	11:13	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-015	11/18/2020	11:15	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-016	11/18/2020	11:17	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-017	11/18/2020	11:19	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-018	11/18/2020	11:20	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-019	11/18/2020	11:22	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-020	11/18/2020	11:24	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-021	11/18/2020	11:21	G	SO	1	16 oz. plastic jar	X		X				4	GJ46599769	
HPPG-ESU-TU079A-022	11/18/2020	11:18	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-023	11/18/2020	11:16	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-024	11/18/2020	11:25	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-ESU-TU079A-025	11/18/2020	11:30	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	

CHAIN OF CUSTODY

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Project Manager: Lisa Bercik

Phone #: (619)213-3389

Send Report to: Rose Condit
Phone/Fax Number: 415-987-0760
Address: 4005 Port Chicago Hwy
City: Concord, CA 94520

Sample Lead: Lewis, Devin

Sample Tech(s): Andrew Murri
Paul LeBlanc

Project Number: 501197

Project Name: Hunters Point Naval Shipyard: Parcel G Remedial Action

Project Location: San Francisco, CA

Purchase Order #: 1159058

Shipment/Pickup Date: 11/18/2020

Waybill Number: 4457 0225 6310

Lab Destination: Test America (St. Louis Lab)
13715 Rider Trail North
Earth City, MO 63046

Lab Contact Name/ph #: Rhoeda Ridenbower (314)298-8566

	Collection Information						Analysis Requested								
Sample ID	Date	Time	Method	Matrix	# of Containers	Container Type	Gamma Spec (EPA 901.1 M) - Full 21 day in growth gamma		Strontium-90 (EPA 905 MOD)				Dose Rate uR/Hr	Evidence Bag ID	Comment
						Preservatives (water)									
						Preservatives (soil)									
HPPG-F-039	11/18/2020	10:40	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	
HPPG-F-040	11/18/2020	11:01	G	SO	1	16 oz. plastic jar	X						4	GJ46599769	

All Transfers for COC 501197RSY-035

Relinquished By:	Relinquisher Signature:	Relinquish Date Time:	Received By:	Received Signature:	Receive Date Time:
Lewis, Devin		11/18/2020 14:06	SHIPPEDTOLAB		11/19/2020 0915

Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-40475-2
SDG Number: GJ46599769

Login Number: 40475
List Number: 1
Creator: Greer, Diane A

List Source: Eurofins TestAmerica, St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-2
SDG: GJ46599769

Qualifiers

Rad

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-2
SDG: GJ46599769

Method	Method Description	Protocol	Laboratory
905	Strontium-90 (GFPC)	EPA	TAL SL
905.0	Total Beta Strontium (GFPC)	DOE	TAL SL
A-01-R	Isotopic Plutonium and Neptunium (Alpha Spectrometry)	DOE	TAL SL
DPS-0	Preparation, Digestion/ Precipitate	None	TAL SL
DPS-7	Preparation, Digestion/Precipitate Separation (7-Day In-Growth)	None	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy
EPA = US Environmental Protection Agency
None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-2
SDG: GJ46599769

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-40475-1	HPPG-ESU-TU079A-001	Solid	11/18/20 10:38	11/19/20 09:15	

Client Sample ID: HPPG-ESU-TU079A-001

Date Collected: 11/18/20 10:38
Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-1

Matrix: Solid

Method: 905.0 - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Total Beta Strontium	0.0206	U	0.0598	0.0598	0.160	0.0474	pCi/g	01/22/21 08:52	02/12/21 10:39	1
Total Beta Strontium	-0.0120	U	0.0628	0.0629	0.160	0.0525	pCi/g	01/22/21 08:52	02/12/21 10:39	1
Total Beta Strontium	-0.00245	U	0.0573	0.0573	0.160	0.0474	pCi/g	01/22/21 08:52	02/12/21 10:40	1
Total Beta Strontium	-0.0397	U	0.0490	0.0490	0.160	0.0439	pCi/g	01/22/21 08:52	02/12/21 10:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Sr Carrier	*85.1*		*40 - 110*	*01/22/21 08:52*	*02/12/21 10:39*	*1*
Sr Carrier	*92.8*		*40 - 110*	*01/22/21 08:52*	*02/12/21 10:39*	*1*
Sr Carrier	*90.3*		*40 - 110*	*01/22/21 08:52*	*02/12/21 10:40*	*1*
Sr Carrier	*91.7*		*40 - 110*	*01/22/21 08:52*	*02/12/21 10:40*	*1*

Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.0656	U	0.149	0.149	0.331	0.117	pCi/g	01/20/21 11:20	01/29/21 17:25	1
Strontium-90	-0.0256	U	0.149	0.149	0.331	0.124	pCi/g	01/20/21 11:20	01/29/21 17:25	1
Strontium-90	-0.103	U	0.175	0.175	0.331	0.152	pCi/g	01/20/21 11:20	01/29/21 17:25	1
Strontium-90	0.0844	U	0.179	0.179	0.331	0.141	pCi/g	01/20/21 11:20	01/29/21 17:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Sr Carrier	*85.3*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Sr Carrier	*92.5*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Sr Carrier	*90.2*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Sr Carrier	*91.9*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Y Carrier	*86.0*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Y Carrier	*95.3*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Y Carrier	*87.5*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*
Y Carrier	*92.0*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:25*	*1*

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Plutonium-239/240	-0.00379	U	0.00536	0.00537	0.100	0.00624	pCi/g	01/08/21 14:15	01/19/21 18:55	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Pu-242 (T)	*94.6*		*30 - 110*	*01/08/21 14:15*	*01/19/21 18:55*	*1*

Method: 905 - Strontium-90 (GFPC)

Lab Sample ID: MB 160-495823/16-A
Matrix: Solid
Analysis Batch: 497166

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 495823

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.3349		0.296	0.297	0.331	0.217	pCi/g	01/20/21 11:20	01/29/21 17:26	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Sr Carrier	*53.1*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:26*	*1*
Y Carrier	*90.5*		*40 - 110*	*01/20/21 11:20*	*01/29/21 17:26*	*1*

Lab Sample ID: LCS 160-495823/1-A
Matrix: Solid
Analysis Batch: 497166

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 495823

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec	%Rec. Limits
Strontium-90	8.29	7.692		0.816	0.331	0.124	pCi/g	93	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Sr Carrier	*91.0*		*40 - 110*
Y Carrier	*89.7*		*40 - 110*

Method: 905.0 - Total Beta Strontium (GFPC)

Lab Sample ID: MB 160-496230/6-A
Matrix: Solid
Analysis Batch: 498804

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 496230

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Total Beta Strontium	-0.1325	U	0.0916	0.0921	0.160	0.0865	pCi/g	01/22/21 08:52	02/12/21 10:40	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Sr Carrier	*53.3*		*40 - 110*	*01/22/21 08:52*	*02/12/21 10:40*	*1*

Lab Sample ID: LCS 160-496230/1-A
Matrix: Solid
Analysis Batch: 498804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 496230

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec	%Rec. Limits
Total Beta Strontium	8.28	7.756		0.626	0.160	0.0465	pCi/g	94	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Sr Carrier	*91.0*		*40 - 110*

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Lab Sample ID: MB 160-494387/1-A
Matrix: Solid
Analysis Batch: 495794

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 494387

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Plutonium-239/240	0.001910	U	0.00382	0.00382	0.100	0.00444	pCi/g	01/08/21 14:15	01/19/21 18:55	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Pu-242 (T)	*91.3*		*30 - 110*	*01/08/21 14:15*	*01/19/21 18:55*	*1*

Lab Sample ID: LCS 160-494387/2-A
Matrix: Solid
Analysis Batch: 495795

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 494387

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec	%Rec. Limits
Plutonium-239/240	2.64	2.527		0.253	0.100	0.00619	pCi/g	96	81 - 125

Tracer	*LCS %Yield*	*LCS Qualifier*	*Limits*
Pu-242 (T)	*93.9*		*30 - 110*

Lab Sample ID: 160-40475-1 DU
Matrix: Solid
Analysis Batch: 495933

Client Sample ID: HPPG-ESU-TU079A-001
Prep Type: Total/NA
Prep Batch: 494387

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	RER	RER Limit
Plutonium-239/240	-0.00379	U	-0.00577 0	U	0.00668	0.100	0.00775	pCi/g	0.16	1

Tracer	*DU %Yield*	*DU Qualifier*	*Limits*
Pu-242 (T)	*108*		*30 - 110*

Rad

Leach Batch: 493198

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	Dry and Grind	
160-40475-1 DU	HPPG-ESU-TU079A-001	Total/NA	Solid	Dry and Grind	

Leach Batch: 494039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	Dry and Grind	

Prep Batch: 494387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	ExtChrom	493198
MB 160-494387/1-A	Method Blank	Total/NA	Solid	ExtChrom	
LCS 160-494387/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
160-40475-1 DU	HPPG-ESU-TU079A-001	Total/NA	Solid	ExtChrom	493198

Prep Batch: 495823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-7	494039
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-7	494039
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-7	494039
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-7	494039
MB 160-495823/16-A	Method Blank	Total/NA	Solid	DPS-7	
LCS 160-495823/1-A	Lab Control Sample	Total/NA	Solid	DPS-7	

Leach Batch: 496229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	Dry and Grind	

Prep Batch: 496230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-0	496229
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-0	496229
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-0	496229
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-0	496229
MB 160-496230/6-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-496230/1-A	Lab Control Sample	Total/NA	Solid	DPS-0	

Tracer/Carrier Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-2
SDG: GJ46599769

Method: 905 - Strontium-90 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Sr	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
160-40475-1	HPPG-ESU-TU079A-001	85.3	86.0
160-40475-1	HPPG-ESU-TU079A-001	92.5	95.3
160-40475-1	HPPG-ESU-TU079A-001	90.2	87.5
160-40475-1	HPPG-ESU-TU079A-001	91.9	92.0
LCS 160-495823/1-A	Lab Control Sample	91.0	89.7
MB 160-495823/16-A	Method Blank	53.1	90.5

Tracer/Carrier Legend

Sr = Sr Carrier
Y = Y Carrier

Method: 905.0 - Total Beta Strontium (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Sr
Lab Sample ID	Client Sample ID	(40-110)
160-40475-1	HPPG-ESU-TU079A-001	85.1
160-40475-1	HPPG-ESU-TU079A-001	92.8
160-40475-1	HPPG-ESU-TU079A-001	90.3
160-40475-1	HPPG-ESU-TU079A-001	91.7
LCS 160-496230/1-A	Lab Control Sample	91.0
MB 160-496230/6-A	Method Blank	53.3

Tracer/Carrier Legend

Sr = Sr Carrier

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Pu-242 (T)
Lab Sample ID	Client Sample ID	(30-110)
160-40475-1	HPPG-ESU-TU079A-001	94.6
160-40475-1 DU	HPPG-ESU-TU079A-001	108
LCS 160-494387/2-A	Lab Control Sample	93.9
MB 160-494387/1-A	Method Blank	91.3

Tracer/Carrier Legend

Pu-242 (T) = Pu-242 (T)